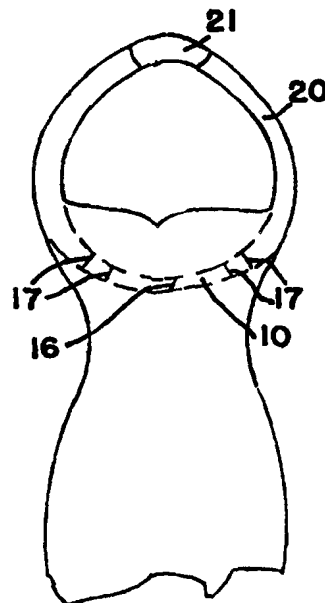
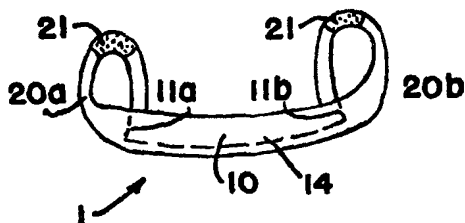




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(21) International Application Number: PCT/US99/17579 (22) International Filing Date: 4 August 1999 (04.08.99) (30) Priority Data: 09/128,463 4 August 1998 (04.08.98) US (71) Applicant (for all designated States except US): LAURA SMITH INNOVATIVE DESIGNS [US/US]; P.O. Box 362, Hilo, HI 96721 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): KATUWAILANI, Nahekeapono [US/US]; P.O. Box 362, Hilo, HI 96721 (US). (74) Agents: ORZECOWSKI, Karen, Lee et al.; Alston & Bird LLP, North Building, 11th floor, 601 Pennsylvania Avenue, N.W., Washington, DC 20004-2061 (US).		(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: BREAST SUPPORT DEVICE



(57) Abstract

A backless breast support device comprising a flexible web or support shelf to support the breasts, with either shoulder straps or a neck strap securing the breast support device to the wearer. The width and stiffness of the flexible web may vary according to the size of the breast. The flexible web and the straps can be elastic, cushioned, non-slip surface, and adjustable. A breast covering may be included for modesty purposes. The breast support device can be incorporated into a garment and may have fastening means in the web and/or strap to facilitate donning of the same.

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BREAST SUPPORT DEVICE

Field of the Invention

The present invention relates generally to breast support devices and more
5 specifically to a backless breast support device that does not require the use of cups to hold
and support the breasts. The present invention further relates to breast support devices
integrated into a garment, particularly without the need for stocking a variety of sizes.

Background of the Invention

10 Presently, breast support devices are in the form of a brassiere, generally consisting
of two cups to support the breasts and a trunk-encircling elastic strap to secure the cups to
the body of the wearer around the trunk region by means of a releasable securing device in
either the back or the front of the brassiere and two shoulder straps are utilized to provide
additional support and security to the wearer. Where a backless brassiere is used without
15 the shoulder straps, relatively cumbersome support systems are used that extend around the
wearer's midriff or complicated strap arrangements are used to cross the wearer's back
below the level of most backless fashions. These typical brassiere designs are
uncomfortable and confining and often impractical to wear with backless apparel;
furthermore, such a design for swimwear results in unwanted tan lines. Furthermore, the
20 use of the strap to encircle the trunk or torso of the wearer often presses into the flesh of
the wearer creating protruding swelling on either side of the strap, resulting in an unsightly
appearance and discomfort.

The object of the present invention is to provide a backless breast support device
that does not use a cup design to provide the support to the wearer's breasts but furnishes

the full support of a regular bra but without the uncomfortable strap around the torso and binding cups covering the bust even during athletic activity. The invention can also be used for wearing backless dresses or incorporated into clothing such as one-piece and two-piece bathing suits, shirts, and dresses.

5 Several previous inventions including U.S. Patent Numbers 3,998,231, 3,306,299, 3,216,425, and 3,109,431 have disclosed manufactures of backless bras; however, unlike the present invention, all of those brassieres require the use of cups to support the breasts, with some requiring the use of additional support means such as underwires or strings. The present invention eliminates these problems with conventional brasseries by providing a
10 significantly more comfortable breast support device that does not encircle the trunk or torso of the wearer, thus enabling backless apparel and obviating tan line problems. Furthermore, the breast support device of the present invention is comfortable and practical, even for active women, and avoids the tan line problem when incorporated into a bathing suit. Additionally, the breast support device can readily be incorporated into garments
15 without the prior art problem of sizing according to the cup size of the wearer. No other previous brassieres or breast support devices have solved these problems in the unique manner of the present invention.

Summary of the Invention

20 The present invention is directed to a breast support device provides comfortable support to even active women without encircling the trunk or torso of the wearer and without requiring the use of cups to support the breasts. It has been unexpectedly discovered that a flexible web or support shelf can be used to support the breasts, with either shoulder straps or a neck strap securing the breast support device to the wearer. The

flexible web can be made of any suitable width necessary for supporting the breasts, with a wider width used for larger breasts. Additionally, stiffening means can be used in the flexible web for providing additional support and comfort to the wearer. The flexible web and the straps can be made of any suitable material, and in a preferred embodiment may be elastic, cushioned, may have a non-slip surface at skin contact points, and may have adjustment means for shortening or lengthening the straps or web to better fit the wearer. In an alternative embodiment, the breast support device is a unitary structure with the web tapering to form the strap or straps. In further embodiments, the breast support device of the present invention can include a breast covering for modesty.

In an alternative preferred embodiment, the breast support device is incorporated into a garment to provide support for the breasts and thus obviating the need for wearing a brassiere. In further embodiments, the web and/or the strap or straps may have opening means and length adjustment means. The garments into which the breast support device can be incorporated include bathing suits, dresses, shirts, tops, pull-overs, sweaters, jumpsuits, nightwear, and the like.

Other objects and features and advantages of the present invention will be more fully appreciated by reference to the following detailed description of the preferred embodiments of the present invention when taken in conjunction with the drawings wherein:

Brief Description of the Drawings

Figure 1 is a schematic view of one embodiment of the present invention in which two shoulder straps are used to secure the breast support device to the wearer.

Figure 2 is a schematic view of an alternative embodiment of the device shown in figure 1 wherein the straps are adjustably connected.

Figure 3 is a schematic view of another embodiment with cushioned straps and an adjustable web.

5 Figure 4 is a schematic view of still another embodiment of the present invention with the breast support device incorporated into a bathing suit top.

Figure 5 is a schematic view of yet another embodiment showing the breast support device incorporated into a one piece bathing suit.

Figure 6 is a schematic view of a breast support device incorporated into a shirt with
10 one shoulder strap sewn into the seam and the other shoulder strap disconnectable.

Figure 7 is a schematic view of an alternative embodiment of the present invention showing a breast support device with a neck strap.

Figure 8 is a schematic view of a further embodiment of the invention depicting the breast support device with a neck strap incorporated into a halter style dress with a front
15 clasp.

Detailed Description of the Invention

Referring to the drawings, Fig. 1 shows a preferred embodiment of breast support device 1 of the present invention comprising a support shelf 10 made of a flexible web or
20 other material. The support shelf 10 is made of any suitable material known to one of skill in the art such as soft flexible materials with sufficient strength. At each end 11a and 11b of the support shelf 10 are attached, respectively, shoulder straps 20a and 20b which are also made of any suitable material known to one of ordinary skill in the art. The flexible web

making up support shelf **10** and shoulder straps **20a** and **20b** may be made of a material exhibiting elastic properties, may be cushioned, may have a non-slip surface, or any combination thereof. The cushioning and the non-slip surface may be an integral part of the flexible web material or may be attached by any suitable means such as sewing, glue, adhesives, and the like. In alternative embodiments of the present invention, the breast support device **1** may be covered with another material, such as velvet, to impart a softer and more elegant look. The width of the support shelf is adjustable and will vary according to the size of the breast to be supported. In the embodiment illustrated in Fig. 1, on the side of the support shelf **10** which comes into contact with the wearer's midriff under the breasts is a non-slip surface **14**. Cushioning material **21** is located on each of shoulder straps **20a** and **20b** at the point of contact with the shoulder of the wearer to provide cushioning and additional comfort and to help prevent rolling of strap and cutting into the arm or neck of the wearer.

An alternative embodiment of breast support device **1** is shown in Fig. 2 wherein the breast support device **1** is of a unitary construction with the flexible web making up support shelf **10** tapering by means of portions **12a** and **12b** into shoulder strap portions **20a** and **20b**, respectively. The shoulder strap portions **20a** and **20b** are releasably attached to the breast support device **1** at either the taper portions **12a** and **12b** or at the ends **11a** and **11b** of the flexible web **10** by means of fasteners **13a** and **13b**, respectively. A cushioning material **15** is located on the flexible web **10** to provide additional comfort and non-slip means **14** is located on each of the shoulder straps **20a** and **20b**.

In yet another preferred embodiment, as shown in Fig. 3, the breast support device **1** of the present invention is removeable or adjustable by means of fastener **16**. To provide

additional support, boning material **17**, or any other suitable stiffening means known to one of skill in the art is used to provide additional support for the breasts of the wearer. In an alternative embodiment illustrated in Fig. 3, straps **20a** and **20b** are preferably provided with an adjustable slide **23** so that the length of the straps **20a** and **20b** encircling each of the shoulders can be adjusted to fit the particular wearer.

Fig. 4 depicts another preferred embodiment of the present invention in which a single strap **20** is attached at each of its ends to the ends **11a** and **11b** of the flexible web making up support shelf **10**. The single strap **20** may alternatively be an extension of a unitary support shelf with tapering means as discussed in Fig. 2 above. The use of a wider web to provide additional support is shown. As described above for the embodiments showing two shoulder straps, cushioning and non-slip means can be used on both the support shelf **10** and the strap **20**. Also a boning or stiffening material can be used to provide additional support. The support shelf **10** and the strap **20** can be releaseably fastened or adjusted as described above. It is to be understood that various details of stitching construction are possible with the contemplation of the present invention and will be apparent to those skilled in the art.

Fig. 5 illustrates another embodiment of the invention in which the breasts are covered. In this embodiment, the breast support device **1** has the tapered form as shown in Fig. 2 and the boning material **17** as shown in Fig. 3, but this embodiment also has fabric **18** covering the breasts for those who prefer to have their breasts covered.

The breast support device **1** of the present invention particularly lends itself to incorporation or integration into a garment since it is able to provide comfortable support for a wide range of body types and sizes. In fact, a particularly appealing feature of the present invention is that it finally enables manufacturers of garments to include a true

“one-size-fits-all” breast support device in a garment. No longer are manufacturers constrained by the “cup” size differences between women having the same clothing size.

One embodiment of this integration of the breast support device **1** of the present invention is illustrated in Fig. 6, where it is incorporated into a bathing suit top **30**. The shoulder straps **20a** and **20b** are integrated into the shoulder straps **30a** and **30b** of the

bathing suit top **30** providing comfortable support that still allows swimming and other athletic activities. Another bathing suit top embodiment is shown in Fig. 7, where breast support device **1** is incorporated into bathing suit top **30** just as in Fig. 6 except that this embodiment provides only one strap **20** encircling the neck as discussed in Fig. 4 above.

An alternative embodiment is portrayed in Fig. 8, where the breast support device **1** is integrated into a one piece swim suit **31** with shoulder straps **20a** and **20b** integrated into swimsuit straps **30a** and **30b**. In this embodiment, the ends of the flexible web making up support shelf **10** are extended out into a vee instead of tapered inward to provide additional support and stability within the one piece swim suit **31**.

Still further examples of the breast support device **1** integrated into garments is shown in the remaining Figures. In Figs. 9 and 10, the use of the breast support device **1** is shown in a shirt. The shirt may be either a pull-over shirt (Fig. 9) or a button-up shirt (Fig. 10). The shoulder strap portions **20a** and **20b** can be sewn into the shoulder seam or tacked in place. To provide ease of ingress and egress into the garment, releaseably securable shoulder strap fasteners **13a,b** or support shelf fastener **16** may be incorporated into breast support device **1** as discussed above with regard to Figs. 1-3 and 7. Another embodiment is shown in Fig. 11, in which the breast support device **1** of the type shown in Fig. 4, is integrated into a halter or backless style dress. A releasable fastener **16** permits easier ingress and egress into the garment and it may, in further embodiments, allow for adjustment of the size of the support shelf **10**.

As clearly shown above, and in the drawing figures, the breast support device of the present invention is easy to put on, with no inaccessible hoods or fasteners in the back which require contortions by the wearer to connect them together, and is comfortable to wear.

It is also to be understood that the novel breast support device of the present invention can be used in conjunction with other strap arrangements known in the art as well as others which be apparent to those skilled in the art. In addition, the straps used may be

non-elastic or part elastic as appropriate. Also, adhesive sections or tabs may be used to permit securement of the breast support device without straps which completely encircle the shoulder.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will be readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed is:

1. A breast support device that supports the breasts without encircling the trunk of the wearer, said breast support device comprising

- 5 a flexible web for supporting the breasts of the wearer;
 a strap attached to said flexible shelf for securing said flexible web to the wearer.

2. The breast support device of claim 1 wherein said strap has a first end and a second end and said flexible web has a first end and a second end and said first end of said
10 strap is secured to said first end of said web and said second end of said strap is secured to said second end of said web so that the strap is placed around the neck of the wearer and the web beneath the breasts.

3. The breast support device of claim 1 further comprising a second strap attached
15 to said flexible web, wherein said flexible web has a first end and a second end and said first strap is connected to said first end and said second strap is connected to said second end so that in wearing the breast support device the web is placed under the breasts and said straps are placed so as to encircle the shoulders of the wearer.

20 4. The breast support device of claim 1 wherein said web is tapered at the ends where the strap is secured.

5. The breast support device of claim 1 further comprising a strap adjustment means.

6. The breast support device of claim 5 wherein said strap adjustment means is located at the point of connection of said strap to said flexible web.

7. The breast support device of claim 1 further comprising a flexible web
5 adjustment means.

8. The breast support device of claim 1 wherein said breast support device is incorporated into a garment.

10 9. The breast support device of claim 8 wherein said breast support device is sewn into said garment.

10. The breast support device of claim 9, wherein said garment is selected from the group consisting of a bathing suit, a dress, a shirt, a top, a pull-over, a sweater, a jumpsuit,
15 and nightwear.

11. The breast support device of claim 1 wherein the width of the web is increased for breasts of larger size.

20 12. The breast support device of claim 11 further comprising stiffening means in said flexible web.

13. The breast support device of claim 1 further comprising a non-slip surface on said flexible web at the point of contact with the wearer.

14. The breast support device of claim 1 wherein said straps are elastic.

15. The breast support device of claim 1 wherein said straps are cushioned.

5 16. The breast support device of claim 1 wherein said flexible web is elastic.

17. The breast support device of claim 1 wherein said flexible web is slightly stiffened.

10 18. The breast support device of claim 1 further comprising a breast covering means.

19. A backless breast support device comprising a shelf of slightly stiffened but soft strap-like material which supports the breasts from underneath with a slimmer continuation
15 of said shelf extending under the armpits and over the shoulders and reattaching forming shoulder straps to hold the shelf in place under the breasts without binding the trunk, said shelf having a non-slip inside surface to keep the shelf snugly in place beneath the breasts.

20 20. A backless breast support device comprising a sling of slightly stiffened but soft strap-like material which supports the breasts from underneath with a slimmer continuation of said sling extending upward and around the neck in order to hold the sling in place without binding the trunk.

21. A garment containing a breast support device that supports the breasts without encircling the trunk of the wearer, said breast support device comprising

a flexible web for supporting the breasts of the wearer;

a strap attached to said flexible shelf for securing said flexible web to the wearer.

FIG. 1

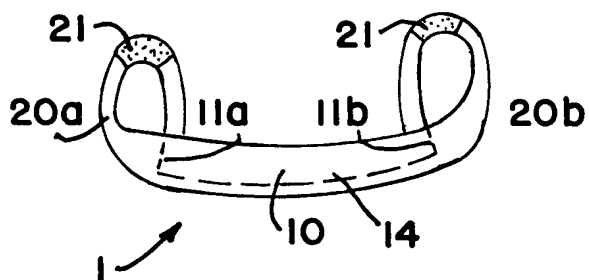


FIG. 2

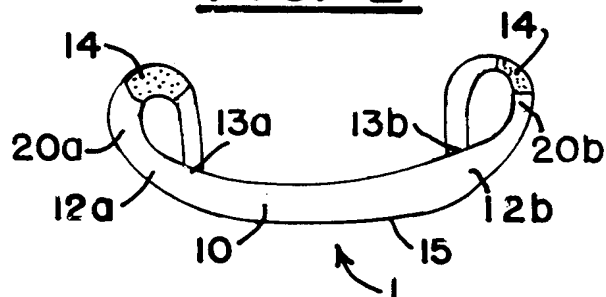


FIG. 3

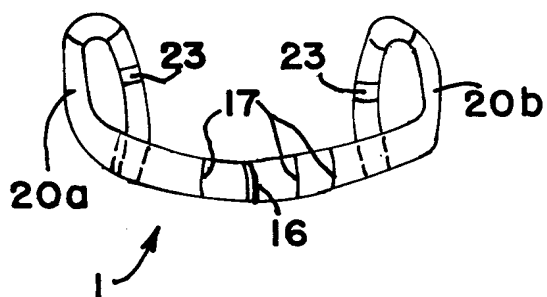


FIG. 4

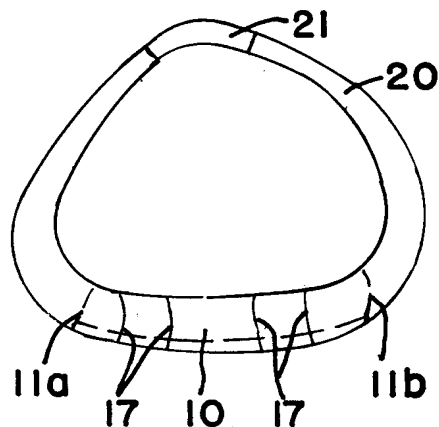


FIG. 5

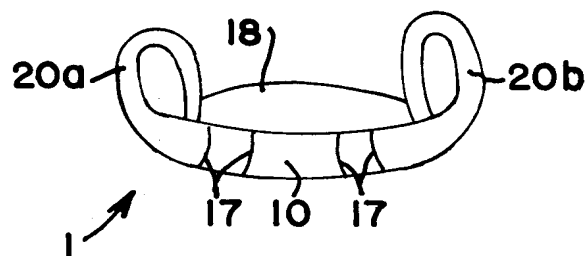


FIG. 6

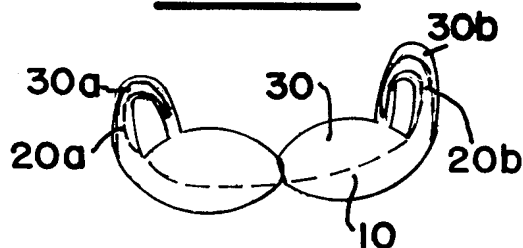


FIG. 7

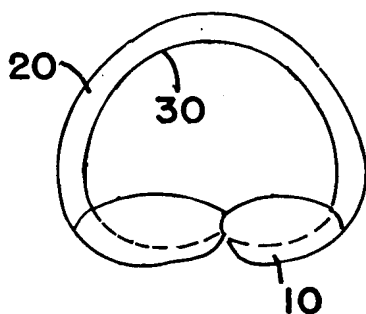


FIG. 8

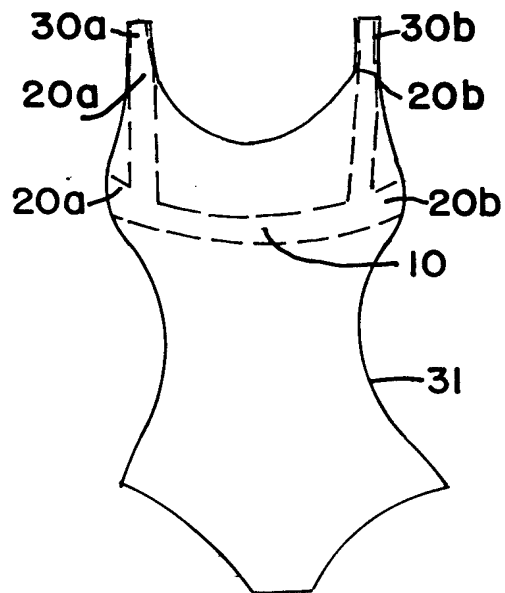


FIG. 9

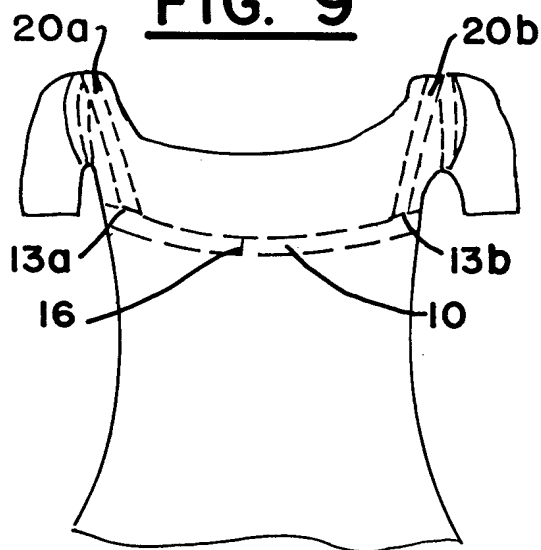


FIG. 11

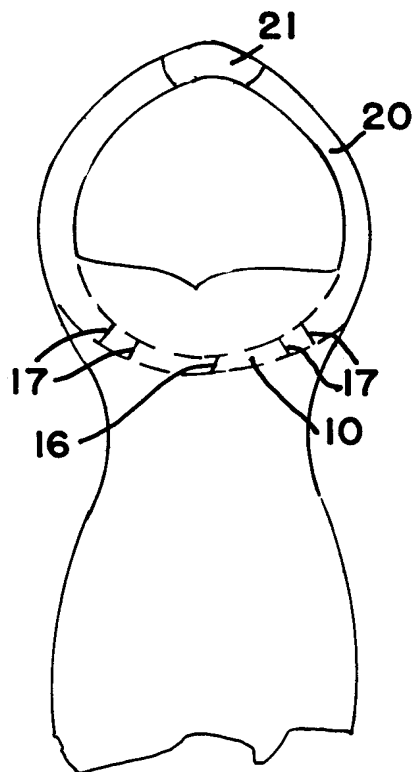
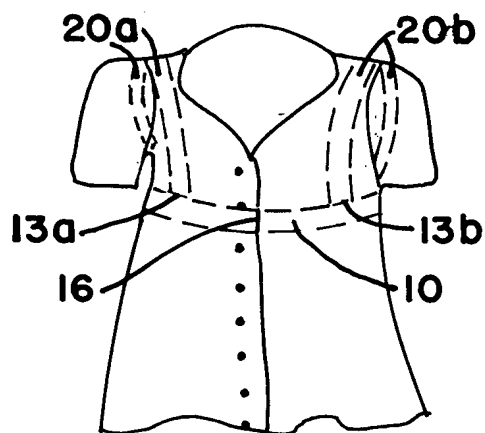


FIG. 10



INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/17579

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A41C3/08 A41D7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A41C A41D A41B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2 428 175 A (NORTON) 30 September 1947 (1947-09-30) column 1, line 4 - line 9 column 3, line 4 column 3, line 33 - line 39 column 3, line 58; figures 6,9	1,2,4,5, 8,21
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

27 October 1999

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Monné, E

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 99/17579

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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